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Abstract

This paper is based on an exploratory case study of four individual hospitals within a large Australian Private Health Group. Five e-procurement issues were investigated from a business perspective. Findings highlight that hospitals perceived that they had an e-procurement system but that the system merely generated a fax purchase order and faxed this directly to the supplier's facsimile machine, i.e. it was not transmitted electronically via the Internet. Findings for price reduction and practice for Direct Vs Indirect goods contradict previous research findings. Nevertheless, reducing wastage, lowering inventory and administration costs were evidently realised. Inadequate user training was a major issue during the implementation process but was later overcome by building a training centre. This paper prompts a challenge for IS/IT academics and practitioners to educate organisations on the definition and adoption of an e-procurement system to enhance benefits across the organisations.

Keywords: E-procurement, Strategy, Implementation Process, Adoption, Direct Vs Indirect Goods, Business Perspective

Introduction

Health spending in the Organisations for Economic Co-operation and Development (OECD) countries is estimated to increase from $2.7 trillion in 2002 to $10 trillion in 2010 (PricewaterhouseCoopers 2005). E-procurement is one of the recommended solutions to improve procurement processes and stock management. E-procurement is referred to as, "business conducting their traditional procurement functions – acquisition of goods in bulk or otherwise or even acquisition of services – over the Internet" (Leonard and Cochran 2002).

Background of Health Industry

The Australian Health Industry is an important sector in Australia and accounts for 6.64% of Australian Gross Value Added (ABS 2003; p.651). Due to the nature of the

procurement process in the healthcare industry, there is a higher rate of human interaction which inevitably increases human error and this leads to inevitable failures (Tucker 2004). Hospitals on average are overstocked by 30% of their total inventory value (Anonymous 2000).

Research Areas

Most of the IS/IT studies on e-procurement are biased towards a technical perspective. This study takes a different approach by examining e-procurement from a business perspective, i.e. to study how non-technical people perceive e-procurement. This paper focuses on five e-procurement research areas from a business perspective:

(a) Perceived understanding of e-procurement;

(b) Selection of an e-procurement strategy;

(c) e-procurement practices for Direct Vs Indirect goods;

(d) Perceived benefits of e-procurement; and

(e) Implementation issues related to e-procurement.

The structure of this paper is as follows: *section 2* reviews literature; s*ection 3* addresses the research methodology; *section 4* examines participant selection; *section 5* discusses data analysis; *Section 6* discusses the results; and *section 7* concludes the paper.

Literature Review

The relevant literature related to the five research areas is now outlined and discussed.

Understanding of e-procurement

E-procurement has been perceived as the solution to exchange information electronically on the Internet in a supply chain network; however, the adoption of an e-procurement was found at a much slower rate than predicted (Davila et al. 2002). The use of e-procurement is well understood by IT/IS academics and practitioners but the question is why business does not adopt an e-procurement solution and technology sooner. One of the reasons could be business does not understand the benefit of an e-procurement solution. Hence, the understanding of e-procurement from a business perspective could be different from an IS/IT perspective.

E-procurement Strategy

To adopt a successful e-procurement system, an organisation must understand how internet technology can be used to improve the efficiency of its procurement process. It is not only the actual benefits and risks that will determine the speed in which the technology is adopted, but also the perceived benefits and risks held by managers and organisations about the technology (Davila et al. 2002). This study uses strategy classification from previous e-procurement studies namely Davila et al. (2002):

- *Aggressive approach* where companies make high investments to gain competitive advantage and are ready to take risks.
- *Conservative approach* where companies 'wait and see' as they are aware of the developments, but are not committing resources or are investing selectively.

- *Passive approach* where companies make observations without experimentation.

E-procurement Practices for Direct Vs Indirect Goods

Direct goods are those that are directly related to the production or service delivery whereas indirect goods are those related to non-production goods such as office supplies and printing (Hawking and Stein 2002). Direct procurement is critical to organisation and managed by experts with deep knowledge and understanding their area whereas indirect procurement usually occurs on a more infrequent basis and the purchasing is often done by non-experts (Gebauer and Segev 2000). Organisations are willing to adopt e-procurement solutions for their indirect goods but are more reluctant for their direct goods (Davila et al. 2002).

Perceived Benefits of e-procurement

The benefit factors of e-procurement include price reduction, shortened process cycle times, reduced administration costs, enhanced inventory management, reduced operational and inventory costs, negotiated unit cost reduction and enhanced decision making (Hawking and Stein 2002).

Implementation Issues

A successful implementation can reap vast rewards in organisational strengths and efficiencies, but failures and improper implementations have taken organisations to bankruptcy (Bhatti 2005). Five non-technical factors, drawn from the literature are seen as pertinent for successful implementation from a business perspective, are:

(a) *Top Management Support* provides leadership and providing the necessary resources, establishing a workable strategy for IT systems and communicating the strategy to employees that will be impacted by the strategy (Bhatti 2005).
(b) *User Training*. Many projects fail due to lack of proper training. Education and training are crucial for a successful implementation (Gunasekaran and Ngai 2004).
(c) *Business Process Re-engineering (BPR)* is required for migration of procurement onto the Internet (Yen and Ng 2002). Implementation factors related to BPR include resistance to change; inadequate attention; inadequate and inappropriate staffing; inadequate developer and user tools; mismatch of strategies used and goals; lack of oversight and failure in leadership commitment (Hammer and Champy 1993).
(d) *User Involvement* involves users to define requirement, to participate in testing and to implement the system (Zhang et al. 2002).
(e) *Change Management* is imperative for the successful implementation of any system and is a primary concern for many organisations involved in project implementation (Bhatti 2005).

Research Methodology

This study is considered to be of an exploratory nature; a case study research approach and interviews were utilised as the means to obtain data (Dubé and Paré 2004; Yin 2003). A better and richer understanding of the examining factors can be achieved through face-to-face interviews with the participants.

Patton's (1980) "interview guide" model was adopted to structure the interview process. The questions were drawn from a combination of previously asked questions and findings from literature, and new questions developed for this study. A number of alternative follow-up questions were prepared to cover different scenarios. The interview guide was piloted with an experienced nurse from a hospital unrelated to the selected sample.

Sample Selection

A private healthcare group HGrpR (a pseudonym), owner of over 70 hospitals and aged care facilities in Australia and overseas, agreed to participate in the study. Four of HGrpR hospitals, namely HH, WM, FT and SG (all pseudonyms - see Table 4) were accessed as case sites for this study. Interviews were conducted with participants. An IT project manager was also interviewed for an overview of the e-procurement system in HGrpR.

	Hospital HH	**Hospital WM**	**Hospital FT**	**Hospital SG**
Year joined HGrpR	2001	2001	2001	2005
Services offered but not limited to	Surgical, Medical & rehabilitation	Medical, Surgical, Diagnostic and Support	Surgical and Post Natal	Medical, Surgical, Orthopaedic, Spinal Care and Cardiac
Bed Capacity	66	136	101	236
Location	Sydney	Western Sydney	South of Sydney	Sydney
Participant	CEO & 2 nurses	Supply Manager	Supply Manager	Supply Manager

Table 4 Summary of participating hospitals

Data Collection and Analysis

In-depth interviews were conducted and a recording device was used in all the interviews. All interviews were transcribed. Thematic analysis was used to analyse the transcripts. The tactic of thematic analysis is to originate patterns, themes and codes (Miles and Huberman 1994). For each research area, results were entered into a table as demonstrated by Miles and Huberman (1994).

Results and Discussions

Interpretive case studies produced a "rich insight" from business perspective on the research areas (Walsham 1995). The results for the five e-procurement research areas are summarised into Table 5 and each research area will now briefly be discussed.

Research Areas		**Hospital HH**	**Hospital WM**	**Hospital FT**	**Hospital SG**
6.1 e-procurement Status		Manual – No system	'P'-system (send by fax)	'P'-system (send by fax)	'S'-system (send by fax)
6.2 e-procurement Strategy		Conservative	Conservative	Conservative	Aggressive
6.3 e-procurement Practices	Direct Goods	Manual (to adopt 'P'-system)	'P'-system	'P'-system	'S'-system
	Indirect Goods	Manual	Manual	Manual	Manual
6.4 Perceived Benefits of e-procurement	Better Visibility of Demand	Unsure	Yes	Yes	Yes
	Shorter Procurement Cycle	Unsure	No	No	No
	Reduced Wastage	Unsure	Yes	Yes	Yes
	Price Reduction	Unsure	No	No	No
	Inventory Management & Administration Costs	Yes	Yes	Yes	Yes
6.5 Implementation Issues related to e-	Training	No system in place yet	On the job training	3 day training (initial)	On the job training
	BPR (Inventory Control)	Experience	Minimum – Maximum	Minimum – Maximum	Minimum - Maximum

procurement	Procurement Responsibilities	Eight nurses	Supply Manager	Supply Manager	Supply Manager
	Change Management	Yes	Yes	Yes	Yes
	Other issues (management support, user involvement and resistance to change)	Yes	Yes	Yes	Yes

Table 5 Summary of Results

E-procurement Status

'P'-system (pseudonym) developed by HGrpR is a requisitioning and procurement system. 'S'-system (pseudonym) has similar 'P'-system is used by Hospital SG. However, both the 'P' and 'S'-system create purchase orders that are faxed to the suppliers; the order is then manually input into supplier's system (see Figure 8.) The critical difference between the two perspectives as shown in Figure 7 and Figure 8 is that with the former the purchase order is channelled via the Internet through to the supplier's e-procurement system electronically whilst with the latter, the purchase order is received on the supplier's fax machine.

Apart from Hospital HH, all other hospitals without hesitation had told the researchers prior to interview that they were using an e-procurement system. The authors do not believe HGrpR has implemented a genuine e-procurement system. But from a business perspective, the supply managers interviewed believed that they were using an e-procurement system. Furthermore, the supply managers do not see that having a genuine e-procurement system might further improve the benefits and efficiency for the hospitals in a supply chain network.

"Well we order, we scan into our system but then we send them … by fax so we don't go into anybody else's system." Supply Manager, Hospital WM

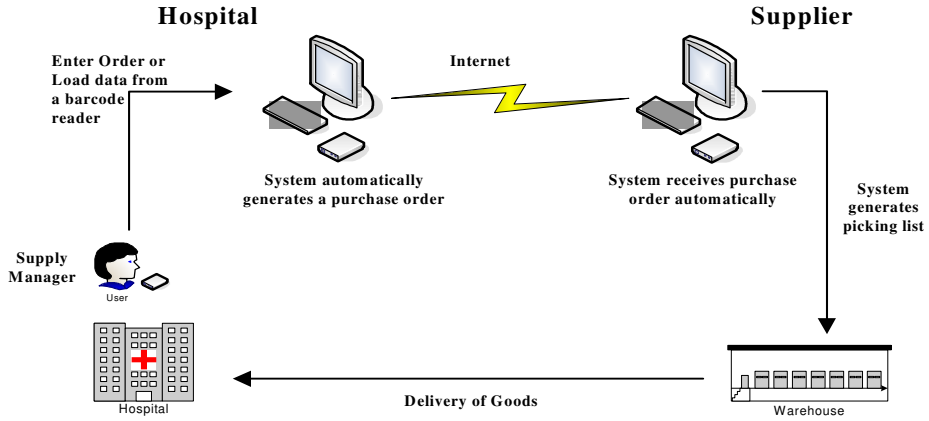

Figure 7 A typical e-procurement system as defined for this study

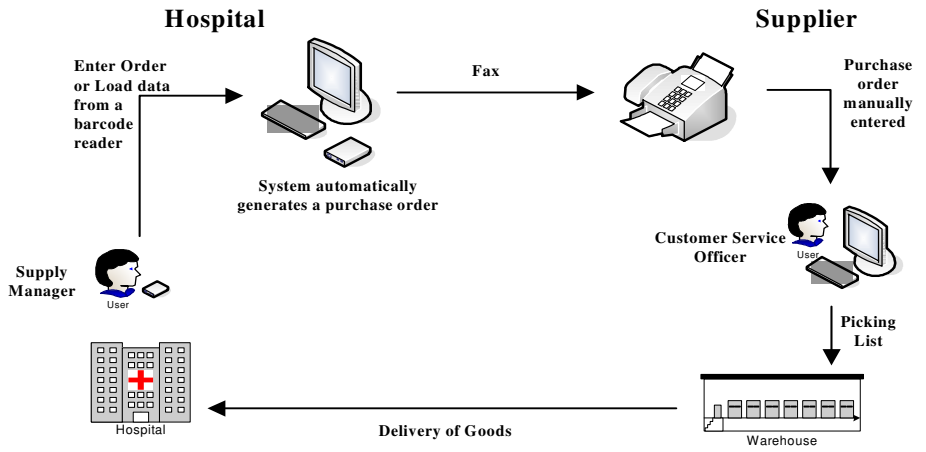

Figure 8 E-procurement system of HGrpR

E-procurement Strategy

The hospitals tend to be more risk-averse and adopt a more *conservative approach* to learn and understand issues related to the adoption and implementation of the e-procurement systems from other hospitals before adopting it themselves. This supported Davila et al.'s (2002) previous finding that organisations are tend to adopt conservative strategy.

E-procurement Practices for Direct Vs Indirect Goods

The main reason for not adopting e-procurement systems for indirect goods was simply that there were too many indirect items to be entered. The hospitals were perceived as having a single e-procurement system for all direct and indirect goods. This contradicts previous findings of Hawking and Stein (2002) and Davila et al. (2002).

Perceived and Experienced Benefits of e-procurement

(a) *Better Visibility of Demand*. The e-procurement system gave supply managers the ability to assess amount of stock is being used weekly in wards and theatres. The system also forecasts on demand based on historical data, thus improving the visibility of demand.

(b) *Shorter Procurement Cycles*. Hospitals did not experience shorter procurement cycles due to the fact that the hospitals did not implement a genuine e-procurement system.

(c) *Reduced Wastage*. The e-procurement system helped to reduce wastage which benefited the hospitals.

(d) *Price Reduction*. No new contract prices were renegotiated between hospitals and suppliers. Price reduction might have been perceived as a driver from IT/IS perspective behind the e-procurement project but it did not eventuate for individual hospitals.

(e) *Inventory Management and Administration Costs*. Hospitals have found a reduction in inventory management and administration costs.

Implementation Issues

(a) *Training*. Inadequate training resulted in disappointment and frustration among the supply managers but the problem was later rectified and a training centre has since been established.

(b) *BPR (Inventory Control)*. The business processes for inventory control and ordering were reengineered and now using bar-coding system that linked to 'P'-system. 'P'-system takes the data and creates a purchase order based on the minimum or maximum amount as specified for each product type; the order is then faxed through to the appropriate supplier.

(c) *Procurement Responsibilities*. A new role, namely supply manager, was created in all cases. The supply manager was to commence and specialise in handling and controlling the procurement duties which previously done by nurses.

(d) *Change Management*. All hospitals under HGrpR are required to implement the 'P'-system. Head office may suggest the implementation of the 'P'-system but hospitals feel they were pressured into the implementation due to political and power issues.

> *"We have no choice …how we implement it and how we go about using it [is up to me]. We just have to implement the 'P'-system" CEO, Hospital HH*

(e) *Other issues*. Issues such as management support, user involvement and resistance to change were not seen as barriers to the adoption of the e-procurement system. The nurses did not resist because the system released them from their non-patient care duties.

Conclusions

The e-procurement system used by HGrpR was solely designed for procurement activities in an individual hospital and was not designed to integrate with the suppliers' procurement systems. The hospitals perceive that they have already gained all the benefits, namely wastage reduction, lowering inventory and administration costs, and developing a genuine e-procurement system is unnecessary. This paper prompts a challenge for IS/IT academics and practitioners to educate organisations in how to define and adopt a genuine e-procurement system to add further enhancements across organisations, and within both supply and demand views of the supply chain network.

Findings for price reduction and practice for Direct Vs Indirect goods contradict previous research findings. The contradiction could be because different industries, historically, have different procurement and business practices. Inadequate user training probably leads to these hospitals adopting a conservative approach to a strategy. The non-adopting hospitals saw problems arising from adopting hospitals and so decided to use a "wait and see" strategy till problems were resolved.

This study provides a "rich insight" (as described by Walsham 1995) into the five research areas of e-procurement from business perspective. However, this study is limited to only a limited to a number of implementation issues. A future study might examine and compare adoption of e-procurement from both business and IS/IT perspectives. A large private health group was the focus in this study and a future study could target public hospitals.

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